

ASCSM

Election
see pages 6 & 7

Special

Using solar energy to recycle CO₂

Sarah Nelson
Staff Writer

Renewable energy sources; we are immersed in many of them on a daily basis. Although this energy is evident every time we step into the sun, actually harnessing these energies and implementing them economically can be a monumental task. Sandia, a National Nuclear Security Administration Laboratory, has taken note of this and has a different perspective on how solar energy could be utilized—not by eliminating a dependence on fuel, but rather by recycling the carbon dioxide already present in the atmosphere to recreate fuel.

Ellen Stechel, manager of Sandia's Fuels and Energy Transitions Department, was very optimistic about this approach of creating fuels from solar energy. While she adamantly maintained that every option should be explored in light of the energy crisis plight, she pointed out some of the formidable obstacles that many of the renewable energy processes being explored would have to overcome to be successful.

Inarguably, there is no lack of renewable energies: solar, geothermal, biomass, and wind are preva-

lent across the globe. However, there are many challenges when it comes to utilizing these renewable energies in a way that would be easily adaptable to present-day society. The first addressed is simply that the technology has still to live up to the scientific theories behind the processes, although with current research, the progress is promising. Another point stated

The CR5 would be powered by concentrated solar heat collected in parabolic dishes. This renewable thermal energy would provide the initial energy needed to recycle, in a sense, carbon dioxide to make fuel.

by Stechel was that these varied energy source's "geographic diversity" places them randomly about the planet and oft times major concentrations are "stranded and far from any major loads." This accentuates the issue of transporting and storing these energies, which would require a complete overhaul of the infrastructure currently in use.

Utilizing concentrated solar energy to reverse combustion

and transform carbon dioxide into carbon monoxide and water would provide a means to create liquid fuel and continued use of the current infrastructure would subsequently ensue. Since the fuel is the same as the liquid fuel in use today, the transition would be easy from an economic perspective.

The invention that would perform this reverse combustion process is named the Counter Rotating Ring Receiver Reactor Recuperator, dubbed the CR5. The CR5 would be powered by concentrated solar heat collected in parabolic dishes. This renewable thermal energy would provide the initial energy needed to recycle, in a sense, carbon dioxide to make fuel. Stechel postulates that by "reusing" fuel, the idea of carbon dioxide as a waste product would be reinvented

into hopefully an "increased value and of utilization of CO₂" and furthermore, lead to the containment of harmful emissions to an extent.

The prototype for the CR5 has been constructed and is within days of a trial run. Sandia looks forward to the successful testing and possible implementation of this new solar to petrol technology that will hopefully provide energy security and mitigate climate change.



PHOTO COURTESY SANDIA NATIONAL LABORATORIES

One of the parabolic dishes to be used to provide energy.

ASCSM decides wording of bus pass vote

Ian Littman
Assistant Webmaster

ASCSM spent the abbreviated March 19 meeting arguing about the wording of the ballot item concerning the bus pass, paid for by Mines's Intermodal Transportation Fee. Due to a rate increase on the part of RTD, keeping current service levels would require a rate increase of \$6 per semester, to \$46 total per semester. The alternative options would be to downgrade RTD passes, keeping the fee the same or raising it by inflation, or to discontinue the Intermodal Transportation Fee entirely, along with RTD service.

The RTD College Pass, the program in which Mines currently participates, increased in price twice in the last two years; the Intermodal Transportation Fee started at \$35, and last year increased to \$40 to cope with the rate increase. The increase applies to all students on-campus, though the proportion of students who pick up a pass is 55%, a number comparable to other campuses who participate in the program. A monthly pass with equivalent fea-

tures would cost several times the Student Pass rate.

RTD also offers more limited options for its college pass. \$42.55 per semester provides students with the current amenities, minus SkyRide access. \$34.66 per semester, roughly the amount paid by Mines when the Intermodal Transportation Fee was instituted, now allows for local access (the 16 and 17 bus routes) as well as discounted fares elsewhere.

After much discussion and debate, ASCSM members voted to

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allow for three options available to students voting regarding the measure: increase the per-semester rate to \$46 and keep current amenities, increase the rate by inflation to \$41.20, or disband the fee entirely. The delta between \$41.20 and the price of the reduced-access RTD pass would be used for on-campus sustainability efforts, such as bike racks and discounted tickets for transportation not covered by the

downgraded RTD offering.

Due to limitations of the Banner administrative system and concerns about bias inherent in a three-choice single-question system, ASCSM members decided that the vote on this matter would be conducted as a series of two questions in the online voting system. The first will be of whether to keep current amenities, thus raising the fee, or not. The second, contingent on not raising the Intermodal Transportation Fee to \$46 per semester, would be of whether to keep the fee at all. If the fee is kept, it will be raised at least by the amount of inflation, which was 3% for this year.

Despite a comment to the contrary by Board of Student Organization's Treasurer Karlyn Adams, a notice of the inflationary increase will be mentioned in the question series.

Derek Morgan had prepared a presentation regarding the RTD pass, however was unable to present due to technical difficulties. Check the online version of this article for a link to the presentation or to discuss how you will vote on the pass.

ASCSM hosts three candidate debates

Ian Littman
Assistant Webmaster

Thursday's ASCSM meeting was quite different than the usual convocation; the overwhelming focus of the meeting was on the upcoming student government elections and the platforms of each major student government candidate. Student Body President Kevin Duffy was pleased to announce the first ASCSM election forum in, if not forever, then at least a long while.

Sophomore, Junior, and Senior class president candidates started the ASCSM election forum, which lasted for about half of the nearly two-hour meeting. Most notably, the Junior class presidency was contested by current Sophomore Treasurer Ben Seling and Keith Stevens. Seling, absent due to a calculus test, had prepared remarks, which were read during his allotted speech time, and included goals of reaching out to the Mines community and beyond to tailor such things as bus passes and restaurant hours.

Board of Trustees candidate Damien Illing then spoke about his upcoming position; another candidate had missed the deadline

for signature collection. The floor was then opened for questions, which included that of how he would approach Board of Trustees members with student concerns, posed by Faculty Advisor Derek Morgan. He responded that matters would be dealt in as direct a manner as possible, though without the less-reasoned facets of his constituency's views. Regarding student views, he plans to create an anonymous drop box to collect them.

Next, current Sophomore Representative John Bristow and Ashley Young, a junior, made their opening remarks contesting the position of Student Body Vice President.

Bristow's main thrust was increased ASCSM involvement in both student-focused and administrative roles, backed by this school year's resolution to add another student to the student body representation at Faculty Senate meetings.

Young's platform included general campus outreach and creation of a committee to oversee and examine the various fees that students currently pay.

SEE "CANDIDATES DEBATE" ON PAGE 7

Scientific discoveries this week

Jake Rezac, Content Manager

Sheffield, UK: Scientists in California, Canada, and the UK have made a discovery which helps to explain how solar weather affects Earth. The researchers, who have detected twisting waves in the Sun's atmosphere, say it helps to explain why the Sun's corona is hotter than the Sun's surface. The scientists believe this new understanding will help climate scientists to predict how the sun's rays will affect the Earth in the future.

Philadelphia, Pennsylvania: Researchers at the University of Pennsylvania have engineered nerve tissue which causes nerve regeneration in animals. Scientists hope this will help the estimated 300,000 Americans who suffer from nerve injuries each year. To prevent permanent damage, nerve regeneration must occur quickly, which is what scientists say their new technique does. According to the discoverers, this is a brand new way of generating nerves.

Beijing, China: Geologists in Beijing have discovered dinosaur fossils which may have implications on thoughts about the earliest instances of feathers. While feathers on dinosaurs are not a new discovery, the newly found fossils are on a dinosaur on a different side of the dinosaur evolutionary tree than the feathered dinosaurs. Researchers say it indicates that feathers evolved many times in dinosaur evolutionary history.

Livermore, CA: Scientists have developed an anti-mosquito laser to prevent malaria. Malaria, which kills over 1 million people per year, is transmitted by mosquitoes. The scientists, who began their research after seeing a satirical YouTube video with the same concept, hope that the laser systems will be deployed as shields for villages.

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Headlines from around the world

Emily Trudell, Staff Writer

Pranav Veera, a six-year-old boy living in Ohio, has been found to have a one-in-a-million **IQ of 176**. The child appears to have a photographic memory, can spell the alphabet backwards, and is able to name all of the US presidents, in order.

The body of 18-month-old **Emma Leigh Barker** was found on a freeway near Los Angeles. Her mother, who remains unnamed and was the last person to see the child, claims that the child died accidentally, and that she fearfully dumped the body on the freeway.

Actress **Natasha Richardson** died after suffering blunt trauma to the head and internal bleeding during a skiing accident at a resort in Quebec. Though she seemed fine initially after the accident, her condition deteriorated and she was brought to a Canadian hospital, where she died Wednesday.

Josef Fritzl, the 73 year old Austrian man who pleaded guilty to enslaving his daughter for 24 years, fathering seven children with her, and allowing one of the children to die, was sentenced to life imprisonment in an institution for mentally ill offenders.

More babies were born in the United States in 2007 than in any other year, with 4,317,119, far surpassing the record set in the **baby boom** era. The percent of babies born to unwed mothers increased to 40% and the amount of babies born to teenagers also increased significantly.

The fossilized remains of a **95 million-year-old octo-**

pus were discovered. The octopus is one of the rarest fossils ever found, as it is composed mainly of muscle and soft tissues that generally decay very quickly after death. Though there are nearly 300 known species of octopus, none have ever been found in fossilized form.

Charles Clemens, a 61-year-old man from Kansas, faces bigamy charges after one of his two wives discovered him with his other wife. Clemens married the first woman 22 years ago and the second woman three years ago.

In his first interview since leaving office, former President **George W. Bush** said that he would not criticize Barack Obama. Mr. Bush spoke at an event in Calgary, Canada entitled "Conversations with George W. Bush," an invitational speech with about 2000

people paying \$3,100 to be present.

A 7.9 magnitude **earthquake** occurred off the main island of Tonga, causing fears of ash and lava flows. A two hour tsunami warning was issued for countries located within 625 miles of the epicenter of the quake.

A group of European scientists have used genetic engineering to modify **tobacco** plants to produce a powerful anti-inflammatory protein that could help patients suffering from insulin-dependent diabetes or other autoimmune diseases.

Two United States **naval vessels**, a submarine and an amphibious ship, collided in the Strait of Hormuz between Iran and the Arabian Peninsula. 15 sailors were reported to be slightly injured, and both ships suffered some minor damages, and are currently heading toward port for repairs.



Local News

Dr Terry Parker will interview for the position of Provost at Mines this Wednesday and Thursday, March 25 and 26.

The CSM Golf Team's Joe Schwark was named RMAC's Golfer of the Week.

CSM's Wrestling Squad was ranked 2nd on the Division II All-Academic list. The team posted a 3.424 average GPA.

Diamond AnniversarE-Days tickets will go on sale this week.

Akira Rattenbury, Geological Engineering, has won a Critical Language Scholarship to study Arabic. The award letter said, in part, "The Bureau of Educational and Cultural Affairs of the US Department of State, the sponsor of the Critical Language Scholarship Program, joins the Council of American Overseas Research Centers (CAORC) in offering congratulations on your acceptance. The applicant pool was highly competitive, and the review panels found your application impressive. We hope you will find this a rewarding opportunity for your academic and professional development."

Ashley Young, Chemical Engineering, has been selected as a finalist for the Truman Scholarship in public policy. She is interested in pursuing a project that will change perceptions about how we think about, use, and abuse water.

[info courtesy CSM]



New chemical process opens doors

Jake Rezac
Content Manager

Dr. Charles Hoyle of the University of Southern Mississippi, in a talk he gave at Mines last Friday, spoke of a process he and his colleagues have developed called Thi-ol-Ene Chemistry. Hoyle explained that, "It's kind of a different way of looking at chemistry... it's like how you've always wanted chemistry to be."

Hoyle began his talk by explaining click chemistry, a chemical philosophy which specifies quickly generating substances by joining small chemical units together. "The idea of click chemistry

was founded by Barry Sharpless... and it's a great process," Hoyle explained. "But under standard processes, you have to use catalysts (copper)... and copper is not always a great thing to leave in a chemical." This downfall of click chemistry was the jumping point for Hoyle's research.

"That [click chemistry] is a great way of doing chemistry, but how can you extend that?"

He explained that, in his research, he looks for a number of properties in his chemical reactions: high conversions and little or no side products, no purification required, and rapidness.

"You mix it together, you put it in

the NMR [nuclear magnetic resonance spectrometer], and you have exactly what you need. No cleanup, no nothing," he explained of his ideal chemical process. This ideal process, he explained, is exactly what he and his colleagues have done.

"Do you know how many tri-vinyl esters which are pure that you can buy in the history of chemistry? None. It's two steps... you mix them together... and shine light on them. Literally five minutes, with 100% yield," he explained of his process, which can be powered by sunlight, if a chemist desires.

Hoyle has already begun producing items which use this process. He described one use which should be in production soon.

"You can imprint this material to your teeth and make a mouth guard and have... 91% energy absorption by the mouth guard. This has implications for saving teeth for athletes and for head trauma victims," he said.

He also described a method by which this process can be used in PET (polyethylene terephthalate) water bottles, which are built to keep oxygen from flowing into the bottle and interacting with the water.

"PET is good... but in one case... no oxygen goes across it. None. It keeps oxygen out." Even

New Vice President of Student Life takes office

Spencer Nelson
Content Manager

On March 16, President Scoggins announced that Dr. Daniel Fox was taking over the position of Vice President of Student Life, a role left by Harold Chevront after 32 years. Fox brings to office many plans to continue improving student life on campus and is excited for the opportunity. "This is what I've spent the last 18 years preparing for," said Fox. "This is my craft. This is what I've refined and worked on for several years."

Fox came into an ever-changing office that has new opportunities and challenges every year. "We do a lot more things than we did 10 years ago in student support," stated Fox. Changes, such as an increased student body, make Fox's new position considerably different than what Chevront stepped into in 1976. Fox explained, "Over the years... [Student Life] has really grown and changed in the demands of the position and the load that is there."

Many changes are expected around the Student Life department. Fox mentioned that President Scoggins intends on looking around the department to see what is and isn't necessary in Student

Life and rearranging as required. However, "I don't see many people here not working real hard," said Fox. The changes around the department are simply a result of the continuous development in their service to students.

"I didn't come to this institution with the idea that I'd become the VP of Student Operations," admitted Fox. Although his intentions were less ambitious, he does believe he is adequately prepared for his new role. As Dean of Students for Spaulding University, Fox had many of the same responsibilities as he will as Vice President of Student Life at Mines. He expects his "role primarily will be more of the senior administration stuff, like working with the Executive Committee, working with the Board of Trustees, and working with the other Vice Presidents on campus very closely to be the one who overall is responsible for all the student life components"

Fox comes from a considerable background in higher education. He received his undergraduate degree in Biology and English from Montana State. After graduating, he earned his teaching certification and spent a few years as a high school teacher. Returning to college, he gained his Masters degree

CSM Academy discusses America's oil problem

Anand Erdenebileg
Staff Writer

Hossein Kazemi, Chesebro' Distinguished Chair and Professor of Petroleum Engineering at Mines, spoke at the March 20 CSM Academy on the topic of Petroleum Reservoirs and Oil Supplies.

Kazemi, who has been teaching at Mines since 1981, believes that the United States has a strong ability to produce oil and gas in the future.

"People don't tell the truth... the fact that we can use a lot of energy sources efficiently. Oil and gas will be a major source for our growing environment." According to Kazemi, the US spends \$86

The US spends \$86 million for oil and gas in one year

million for oil and gas in one year and the world uses 500 billion barrels per year.

Kazemi stated that America needs more oil and energy resources because it leads the world in use of the aircraft. These aircraft consume 26 trillion cubic feet oil per year. Furthermore, it has been predicted that 1.2 billion cars will be on American roads by 2016. Kazemi believes that new technologies must be developed to keep up with this fuel demand.

The United States energy usage statistics are that oil is 40% of our total energy, gas 22%, coal 3%, nuclear 8%, and hydroelectric 7% per year. However, most of these resources require the extensive

production of carbon dioxide. To change this, reliable and profitable new technologies are needed. There are three types of gases which can be used, according to Kazemi. These are conventional gas, which produces large quantities, unconventional gas, which is very difficult to produce, and ultra-unconventional gas, which requires a huge amount of energy to produce. "In order to produce the ultra-unconventional gas, we need 60 Gigawatts, which this energy is capable to give electricity to large 100 American big cities," says Kazemi.

Kazemi concluded that today's students are our future. "I encourage my students to solve these problems for their own future. We need to do this project as soon as possible so that fuels and the energy will be more productive."

ASCSM elections are here!

Meet your candidates, find out where they stand, make your choice



ASCSM Elections 3/30 and 3/31

Geek of the Week

Alec Westerman
Staff Writer

Do you consider yourself a geek?

Yeah.

Do you think other consider you a geek?

Yeah, I think others consider me a geek, especially when they see me in the cafeteria with my headphones on listening to MIT lectures.

Why headphones, even in class?

Ever since I got my first mp3 player in eighth grade, I wear them during class. It just helps me focus better.

What is your favorite type of music?

Classic rock.

What do you listen to your music on?

A Zune.

Why did you choose a Zune over anything else?

I got it for ninety dollars on Black Friday.

Do you prefer Microsoft or Mac?

Microsoft... I'm just so used to it. I use Media Center a lot.

Is it true that you work on homework during class?

I do that a lot... I try to use my time as wisely as possible I try to get my homework done the first day it's assigned.

Do you have any strange talents?

I play In the Groove. It's kind of like DDR... I go to tournaments and stuff.

What is the geekiest thing you own?

I'm not like one of those StarTrek type geeks, so let me

...Bryce Robbins, Freshman: Engineering Physics

think... I've got a Rubik's cube, which I guess is pretty typical.

What is the geekiest thing you have done at Mines?

I read text books... I read every page.

What is the geekiest thing you have done in your life?

I play that DDR game almost every day.

Why did you choose to attend Mines?

I like small schools. I'm a really independent type student. I didn't want to go out of state either.

What is your favorite class?

Modern physics... or advanced mathematics.

What are your plans for after college?

Working for... probably Lockheed Martin. [He also commented that he would like to get into renewable energy at some time.]

What are your hobbies?

In the Groove. I play guitar. Obviously, Rock Band and Guitar Hero. I like to run, brush my teeth, and sleep, that just about covers it.

If you could take three things with you to a desert island what would they be?

I'd have a laptop with Verizon broadband. [He then joked about having a Wilson volleyball and continued to list a toothbrush and a dune buggy.]

If you suddenly came by one million dollars what would you do with it?

I'd probably open my company, a company that's devoted to alternative energy... Give some to AIG employees.

What year are you?

Freshman.

What classes are you taking?

Analog Electronics, Modern Physics, Advanced Mathematics for Engineers, Intro into Thermodynamics, Chemistry II, and PA (the running one). ...I aced both of my first Chemistry II exams... I got a 100% on both of them.

Why Advanced Mathematics for Engineers?

It was my last alternative; the PDE class was just too much for me to handle given the rest of my load.



ALEC WESTERMAN / OREDIGGER

Campus Benefactors: Volk

Anand Erdenebilieg
Staff Writer

Russell Herman "Rut" Volk had a long and distinguished career at Mines. He received an Engineer of Mines degree in 1926 and Master of Science (MSc) degree of Mining in 1931. While an undergraduate, Volk earned 15 varsity letters in football, boxing, and wrestling. He was undefeated in boxing and wrestling throughout his four years as an undergraduate. He was also successful outside of sports, holding the position of sophomore class president and Mines delegate to a student leadership conference in Yugoslavia in 1926.

With all these accolades having been received during his time at Mines, it's not surprising that he continued to support the school later in life. In 1956, he received a Distinguished Achievement Medal and was awarded an Honorary Membership in the CSM Alumni Association in 1965. He was a CSM Trustee from 1967 until his death in 1973. He was the president of the CSM Alumni Association in 1939 and a past director of the CSM Foundation, Inc. Rut Volk contributed \$6,720 to CSM during his life, and then bequeathed the School \$123,750 after his death.

According to Marvin L. Kay (Professor Emeritus, Athletics Development Associate) who has been at the school for forty

years, recalls "Volk was the first Hall of Fame in the Colorado School of Mines history. If I want to name the true Alumnus, I would name Rut Volk."

Kay added, "He had a successful reputation in both school and athletics and he was a great family man."

According to the Office of Institutional Advancement, "[He] gained national recognition as a leader in the petroleum industry while serving as president and chairman of the board of the Plains Exploration Co., Denver, an independent petroleum production firm which he founded." He also was a civil activist and was the member on the board of trustees of Colorado Woman's College, director for the United Fund campaign, advisory board member of the Institute of International Education (Rocky Mountain Office), and past president of the Petroleum Club, where he was honored as a "Man of the Year" in 1965 for his contribution to the construction of the club's building.

Russell "Rut" Volk had two children. He had a son, Dick, who graduated from Mines in 1958, and a daughter Denise.

Source:

¹ - <http://www.oia.mines.edu/tour/volk/01.htm>

² - Interview with Marvin L. Kay

³ - http://www.co.jefferson.co.us/placenames/search3.cfm?ps_oid=113090&search



DEIDER BARRICK / OREDIGGER

Art of Science

ERIK LORD / OREDIGGER

Metrorail, Washington, D.C.

"Give me a lever long enough and a fulcrum on which to place it, and I shall move the world."
~Archimedes



A

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♥

V



Ian Littman, Tech Break Columnist

Ra, Roadrunner, and really fast computers

In the basement of the CTLM, behind a locked door and inside a locked data center cage, lies a beast. Since this column is Tech Break, the beast in question is Ra, a supercomputing cluster devoted to studying various energy-related projects. Ranging from biofuel work by Mark Nimlos of the National Renewable Energy Laboratory (NREL) to acoustic and electromagnetic scattering simulations spanning 320 cores on a few dozen nodes, the system's 2144 processing cores, pumping out between 17 and 23 teraflops (trillion floating point operations per second), keep quite busy. Stepping into the miniature data center that houses Mines's servers, Ra among them, is quite literally a chilling experience, due to the high-capacity air conditioning units required to keep the cluster running at maximum speed. Unless you're on the "hot row," where a voluminous cloud of hot air pours through the grating of the Dell racks in which Ra is housed along with the requisite networking and tape backup systems to connect and protect the two-million-dollar rig.

The tour guide, Director of High Performance Computing Services Tim Kaiser, noted at the far end of the racks that a few of the compute nodes, specifically two of the handful of quad-socket, dual-processor servers (the other 256, out of 268, nodes use quad-core, dual-socket processors) had been replaced. The telltale sign: different faceplates on the otherwise-identical gear. The reason: those nodes had gone down a few days before due to the intersection between heavy load and garden-variety statistics, and thus, were swapped out by Dell, Ra's manufacturer, for working systems. Regarding Dell, they're not particularly known for high performance computing initiatives, but they offered the right number of flops at the right time at the right price, and Mines took the offer. Of the deal, Mahadevan Ganesh, one of the chief proponents and users of the system (the only user with 320 cores working in tandem on a single process) says, "Dell came up with a great offer, saying that 'We'll give you so many flops...' [for much less] than Sun was offering." Mines was also in talks with IBM, another major supercomputer manufacturer, but ended up taking the Dell deal. A few circumstances arose from the decision to buy Dell. First was the choice of Intel processors over AMD's new offerings, upon which the world's fastest supercomputer, Roadrunner (in Los Alamos National Laboratory) is partly based. The Intel parts were more readily available, as AMD's chips had a few more pressing customers (among them, "Ranger," a top-ten supercomputer located at UT-Austin). Somewhat less pivotal was the operating system choice: ROCKS, a clustered overlay on RedHat Enterprise Linux, Dell's Linux of choice. Why Linux? "It's not possible to get... big clusters with the Windows operating system [for scientific purposes]," says Ganesh.

A talk with Tim Kaiser served to provide a snapshot of how Ra is put to use. His job is to "help sci-

entists do their science," as he put it. "I have a couple of researchers that I'm working with... basically trying to get their jobs to run more effectively," he added. Among his duties are putting together workshops to show potential users how to take full advantage of Ra's processing power and avoiding possible pitfalls like swapfile usage that reduce performance on such a system by a factor of ten. If the system is used ideally, with routing storage over multi-gigabyte-per-second Infiniband links, processes move along at a good clip whether the cores are dealing with carbon sequestration, enzyme studies, or ways of converting solar energy and water into hydrogen fuel. "The machine is primarily here... to do energy research," Kaiser stated. Kaiser, on the other hand, is there to keep scientists' code running smoothly on the systems, avoiding rather deadly memory leaks and, if possible, swapfile usage, which pushes tasks normally reserved for memory into hard disk space, which is orders of magnitude slower.

In all, around 70 users are active on the system, using around 16% of the 300 TB storage array as of a few weeks ago. One of the more notable projects featured in this month's Golden Energy Computing Organization (GECO) newsletter is by Matt Walsh studying Gas Hydrate formation. "Gas hydrates are solid ice-like compounds in which gas molecules, such as methane and ethane, are trapped in hydrogen-bonded water cages (resembling microscopic soccer balls)... in spite of its industrial significance, the molecular mechanism of hydrate nucleation has remained intractable to researchers because its physics are governed by a disorder-to-order 'rare event' phase transition... Before this research, no 'Top-300' supercomputer had been used to simulate the process...[h]owever, the formidable computing power of 'Ra' has already allowed the CSM Chemical Engineering department to simulate the nucleation of hydrates by "brute-force" molecular dynamics techniques," the newsletter project description states. As this article is being written, Walsh has 33 jobs running on Ra, totaling a whopping 792-2.6 GHz cores in use for the project.

Each of the 99 nodes on-task is grabbing 6.5 KB/s of bandwidth from the Mines network. Hardly anything per node, to be sure, but in aggregate, the project overall is grabbing about five megabits of bandwidth, nonstop, on the download side and about 100 kilobits on the upload. That's not a ton, but the overall network transfer on Ra stays around fifteen megabits per second, twenty-four hours a day, even when the Mines network gets congested. At times, the gigabit network uplink on the system is utilized a bit more as someone on-campus downloads their data set. Yet, for archival and remote data set purposes, Ra really needs a higher-bandwidth connection. That's why, according to Michael Robbert, system administrator for the cluster, "Those of us in the GECO team, ...and some of the scientists, are the

ones primarily pushing to implement 10 gigabit speeds over that fiber once it's implemented." By "that fiber," Robbert meant the joint CDoT/Mines ring that should go online any day now. I wouldn't say that Ra itself is constrained," he says of the currently-available bandwidth. "Everything that is going to run on Ra is going to run just as fast, but what's going to change if we can get 10 gigabit is in the way that we can share data with scientists off-campus." Robbert also responded on the subject of upgrading Ra, which has already fallen to 285 on the TOP500 supercomputer list. "As far as adding additional nodes, even adding additional memory or faster processors, we're really limited by the power and cooling in the data center right now. We're really pushing the limits of that right now, so there's not much room to expand... over the years, we'll probably have minor things here and there that we'll possibly tweak its capabilities, but nothing major," Robbert stated. "At this point, our next major push is going to be for whatever the next big machine that will replace Ra, and along with that is going to be figuring out what new data center is going to house that."

The "next big machine" architecture was discussed in the greatest detail by Ganesh, who compared Cell processors (used in PlayStation 3 consoles) and GPUs (and their computing-focused brethren, such as nVidia's Tesla series) to the typical arrangement of CPUs used for processing supercomputing tasks. "There is no

drawback," said Ganesh, regarding use of GPUs in a supercomputer, "except you have to currently... think about programming slightly differently than you're used to programming in x86. So... when you learn C programming or FORTRAN or Java, you're pretty much taught to program for CPUs... On the other hand, if you are to do programming [with] GPUs... you have to get into the [GPU] frame of mind. Programming used to be very difficult for GPUs some years back." With nVidia's new CUDA programming language, which is based on C, GPU programming is a lot easier than hardcoding the GPU, but it still remains nonstandard and even proprietary. "Everybody has their own way, and you have to get into their shell to program," Ganesh explained. "On the other hand, [with a] CPU, it doesn't matter who you get it from [or] where you get it from. You program it once, and it runs forever." Since Ra has to cater to the scientists working on it, currently CPUs are the best option from a programming standpoint. "We've got some of our scientists writing their own code," says Robbert of the situation. "But we've also got a lot of scientists that use general purpose code that they have no idea how to write the code for it. All they know how to do is put together different experiments using this code that has been parallelized and completely written by some third party... until those types of applications get ported to Cell or GPUs, we probably won't be using those, at least not as our primary platform." The advantage of Cell processors

and GPUs is speed. Roadrunner derives much of its petaflop-plus performance from Cell processors, and many universities are now augmenting their current x86 (Intel, AMD, etc.) systems with GPUs to drastically increase performance with relatively low hardware and space outlay. "One of the reasons why people suddenly find GPUs very fast [is] because they're really coding a lot in parallel computing [with] a lot of things to work on... you put in a little bit [of] effort, and suddenly, you see that your same code is running ten times faster," says Ganesh of GPUs, which now sport as many as 240 processors apiece. nVidia's Tesla system, effectively a superclocked graphics card with four gigabytes of memory and no video out, can deliver close to a teraflop per card.

Granted, these special-purpose processors aren't great at everything; currently GPUs are 32-bit processor clusters-on-a-card, meaning that four GB of memory is the absolute maximum they can address. This makes them unusable for applications involving large data sets. But what they do, they do very well, provided a scientist or software firm knows how to program for the system. "It'll be interesting to see what will happen, but my feeling is that the best way to proceed is to have a hybrid of CPUs, GPUs, and Cell and program in such a way you're passing the mathematically intensive operations such as [Fast Fourier Transforms] to Cells and GPUs, and the rest of the operations to CPUs," Ganesh said of this synergy. "That is what's done in Los Alamos."



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President

Jaime Thorpe

Hometown: Kingwood, TX
Current Class: Junior
Department: Chemical Engineering
Campus Activities: ASCSM (2006 – present), Theta Tau Professional Engineering Fraternity (Currently re-starting a chapter at CSM), McBride Honors Program (2006 – present), Sigma Kappa Sorority (2007 – present), SWE (2006 – present), AIChE (2007 – present)
Why are you running for this position?
I am running for ASCSM President because I want to deliver to the student body the accountability it deserves. As students, we are the customers of this school, and we must demand that our voices are heard by the faculty, staff, and administration. I will strive to establish a strong working relationship with these parties to ensure that this will happen.
Detail any other offices or positions that you have held on campus.



During my freshman and sophomore years, I served as ASCSM class treasurer. I was then appointed ASCSM Treasurer for the 2008-09 year, during which I have worked diligently building relationships with many student organizations. I also serve as a class representative for McBride, reconciling conflicts between my peers and the administration. Additionally, I serve as President of Theta Tau, an organization we are striving to renew at Mines after an approximately 30 year hiatus.
What makes you a standout person for this job?
I have worked diligently since coming to Mines to represent my classmates through my various leadership positions by promoting honesty, ethics, and transparency in government. I am the best candidate for the position because I am the only candidate who has served on the Executive Council of ASCSM. This gives me greater insight into the role that the president plays, and more experience in dealing with issues that the Executive Council handles.
What would you like to see ASCSM accomplish in the upcoming year?
In the upcoming year, I want to see ASCSM develop a stronger relationship with both the campus and the community. In order to do this, accountability to the students must be our foremost priority. The student government exists to serve the needs of the students, from parking tickets to grading systems. My goal is that the students at-large will guide the course of their governing body and experience the purest form of democracy possible.



Brian Pal

Hometown: Lopez Island, WA
Current Class: Junior
Department: Engineering, Mechanical Specialty
Campus Activities: Cycling Club, Libertarian Club
Why are you running for this position?
I believe that ASCSM's role should be expanded to take a much more active role in working with campus organizations that may frustrate students on a daily basis. Public safety, Aramark, and the registrar's office are just a few examples of organizations that should be changed in order to better serve the students who pay for their services.
Detail any other offices or positions that you have held on campus.
Administrator of the Ran-Duece Facebook group.
What makes you a standout person for this job?
I'm not interested in a popularity contest or another line on my resume. I am going to run a zero-bullshit campaign and if elected I will work to provide changes that will have a real impact on every

student at Mines.
What would you like to see ASCSM accomplish in the next year?
If elected, I will:
Work with public safety to create an accountability system in order to improve relations between officers and students
Work with student life to revamp or replace the Aramark contract when it comes up for renewal in 2010.
Work with the registrar's office to improve and streamline operations.
Expand ASCSM's role to include voting seats on every board on campus.

Lisa Truong

Hometown: Grand Junction, CO
Current class: Sophomore
Department: Engineering, Civil Specialty
Why are you running for this position?
Over the past year, I have seen first-hand how critical student government can be in shaping policies at the Colorado School of Mines. I look forward to representing the student body to the faculty, institution, and community in every facet. I will strive to constantly seek what is best for students. My experience on ASCSM has inspired me to continue working for my peers and keeping my classmates informed and included in school politics.
Detail any other offices or positions that you have held on campus.
Currently, I have the great privilege of being Sophomore Class President. As president, I have aided in organizing class events, establishing Office Hour Forums, and choosing the Class of 2011 t-shirt. Furthermore, I have listened to my peers during the plus/minus grading system debate, opened lines of communication between the Class of 2011 & the Sophomore Officers, and co-authored ASCSM resolutions. Additionally, I am the secretary for PASES and AGC, and a representative for McBride.
What makes you a standout person for this job?
ASCSM has become a high priority for me due to the issues that I have encountered over the past two years. Recently, I have worked intimately on many issues concerning my peers, including co-authoring an ASCSM resolutions to increase the student representatives at Faculty Senate. I feel that with my experience in ASCSM, my varied campus involvement, and my dedication to the student body, I am highly-qualified to serve ASCSM as president.
What would you like to see ASCSM accomplish in the upcoming year?
Student government was created to represent the student body. In the upcoming year, I hope to increase student interaction with ASCSM. By improving dialogue, I hope to tackle issues that concern all students. Some of these matters include concerns with public safety, improving transportation options, and keeping students at the forefront of capital construction. No topic is too big or too small for ASCSM.



Meet the candidates

Other candidates

At Large Community Sharif Jawad	Senior Class President Sara Post	Junior Class President Keith Stevens Ben Seling	Sophomore President Josh Dickerson
At Large Faculty Rambert Nahm	Senior Class Treasurer No Candidates	Junior Class Treasurer Ian Littman Nathan Jorgensen	Sophomore Treasurer Zach Boerner
At Large University Alec Westerman	Senior Class Senator Keith Roman Marilou Canon	Junior Class Senator Justin Tappan Daniel Haughey	Sophomore Senator Mona Finchum Russell Quick

Vice President

Ashley Young

Hometown: Loveland, CO
Current Class: Junior
Department: Chemical Engineering
Campus Activities: Tau Beta Pi Engineering Honor Society, InterVarsity Christian Fellowship, Band, Blue Key, American Institute of Chemical Engineers (AIChE), Kappa Kappa Psi (Honorary Band Organization), Society of Women Engineers (SWE), Student Ambassador, McBride Honors Program
Why are you running for this position?
It is my inherent belief that by serving as Student Body Vice President, I can affect change on the Mines campus. It was Mahatma Gandhi who once said that "you must be the change you want to see in the world." I want to rise to that challenge by listening to and representing the students' views—your views—in a responsible, ethical, and honest manner.
Detail any other offices or positions that you have held on campus.
Currently I serve as Recording Secretary and Activities Chair for Tau Beta Pi, Service/Newsletter Officer for AIChE, and Secretary for Kappa Kappa Psi. I am also a leader in InterVarsity Christian Fellowship and am a section leader in Band.
What makes you a standout person for this job?
It would be an honor and privilege to serve as your Vice President. A consistent attendee and frequent public forum speaker at ASCSM meetings, I have a solid understanding of ASCSM's practical functions. More importantly, I am dedicated to increasing student body participation in ASCSM to ensure all students' voices the opportunity to be heard.
What would you like to see ASCSM accomplish in the upcoming year?
ASCSM should work to improve communication between itself and the student body by publishing surveys and hosting more events to collect feedback from concerned students. Campus parking tickets can and should be decreased by working with Public Safety to develop updated campus parking signs and easy-to-read maps. In conjunction with Student Activities and other fee-collecting entities on campus, ASCSM should work to publish a comprehensive brochure detailing how each student fee is used every year.



John Bristow

Hometown: Golden, CO
Current class: Sophomore
Department: Geological Engineering
Campus activities: Geological Engineering, ASCSM, Phi Gamma Delta, Geology Museum
Why are you running for this position?
I have spent the last two years as a class representative and I feel that I have gained the responsibility to move up and not only help my class but the student body as a whole.
Detail any other offices or positions that you have held on campus.
I currently work as a veteran student aide at the geology museum. In my fraternity, I have helped out with the social activities recently.
What makes you a standout person for this job?
I feel that I have a unique dedication to the students of the Colorado School of Mines and I know if I were to fill this position that I would continue my role of trying to get the student's voices heard not only in the school but in the Golden community.
What would you like to see ASCSM accomplish in the upcoming year?
I would love to see ASCSM address the parking and safety issues on campus and help direct public safety in a way that makes the students more comfortable with them.



The candidates' statements were transcribed directly from written submissions without changes to maintain objectivity. The views expressed above are solely those of the candidates. The Oredigger abstains from endorsing or supporting any of the candidates.

Board of Trustees Representative

Damian Illing

Hometown: Broomfield, CO
Current Class: Junior/Senior
Department: Chemical and Biochemical Engineering (B.S.), Economics and Business (M.S. in ETM)
Campus Activities: ASCSM Senior Class Representative, Tau Beta Pi, Blue Key, McBride, Pre-Med Society, Men's Lacrosse
Why are you running for this position?
I am running for this position because I understand how important open, effective, and consistent lines of communication are between ASCSM and the school's administration. I want to personally ensure that these lines of communication remain open and the relationship between ASCSM and the Board of Trustees remains strong. My experience in ASCSM will make me a great intermediary between the student body and the Board of Trustees, and a strong voice for the students, guaranteeing that the needs of the student body are heard during board meetings.
Detail any other offices or positions that you have held on campus:
Over the past year, I have served as an ASCSM senior class representative. My duties have included participating in ASCSM meetings, organizing class events, and preparing for Senior Bus. For the past three and a half years, I have also served as a class of 2009 McBride Student Representative. In this position I have been the intermediary between the McBride administration and my classmates, have helped reorganize the freshman schedule, and have started a freshman-senior mentoring program.
What makes you a standout person for this job?
My experiences in ASCSM, McBride, and other organizations have given me the opportunity to understand how to work with many different groups of people, and have made me an effective liaison between several different bodies. My involvement in a variety of groups across campus will allow me to ensure the student body's collective voice is heard. I would be a strong voice for the student body on the Board of Trustees, and would ensure that the student's needs are heard.
What would you like to see ASCSM accomplish in the upcoming year?
I believe that one of the most important things ASCSM should strive for in the upcoming year is to further improve the avenues of communication, not just between ASCSM and the school's administration, but, more importantly, between the administration and the student body as a whole. Additionally, I would like to see the implementation of new, beneficial applications for the intermodal transportation fee and the capital construction fee.



Candidates debate at ASCSM

CONTINUED FROM PAGE 1

Student questions, and the resulting debate, mainly consisted of questions regarding public safety, due to the Student Body Vice President's additional position as chair of the Public Safety Committee.
The first concern, voiced by Junior Class Representative Marilou Canon, focused on poor lighting on some parts of the Mines campus. Both candidates replied that they would take necessary measures and contact the appropriate parties to solve this problem.
Bristow mentioned going to the City of Golden, if necessary, while Young focused on disseminating surveys via The Oredigger or otherwise to find out what students wanted in this arena.
The remaining public safety questions focused on the problem of blind spots on-campus, which cost a life last semester, compounded by lack of parking facilities on-campus. Bristow and Young agreed that "red zones," spaces where parking is disallowed (near corners), would likely be needed, stating that safety should trump parking congestion concerns.
Both candidates suggested reworking reserved lot policies to counteract the loss of available parking. Additionally, Bristow championed clarification of parking signage to better inform students of where they may or may not park.
Young, on the other hand, suggested a rewrite of current Mines parking maps, stating that the current maps are confusing and that a more modern map with clearly delineated parking areas, would be ideal.

Truong and Thorpe both stated they would like to see more ASCSM participation

In response to a question, asked by current Sophomore Class Representative Justin Tappan, Young stated that she would be stepping down her involvement in various campus groups in order to better fulfill her role of Student Body Vice President, if elected.
The final debate was between the three Student Body President candidates: Brian Pal, current Student Body Treasurer Jaime Thorpe, and current Sophomore Class President Lisa Truong.
Truong focused on student outreach, calling for increased office hours, participation on part of officers as well as students, and encouraging use of online resources to get student input. Truong stated that she wanted to see more avenues of student government outreach, in addition to ASCSM meetings, including meetings with class presidents and professional societies.
Pal, whose primary leadership experience has been in industry, presiding over a small team of construction workers on \$50,000 projects, was the most specific with his promises, endeavoring to fix such areas as Brown Building classrooms, food services, and other areas of student complaint.
Truong had also discussed oversight on the use of the Capital Construction Fee, which would make such building improvements possible. Pal also announced his intentions of rechecking all campus clubs to see whether they were truly

giving back to the Mines community in accord with the money given them in the Student Activities budget.
Jaime Thorpe started her platform speech with her qualifications: as current Student Body Treasurer, she has overseen the flow of \$600,000 per year. Her main points included assisting clubs so that they may grow, additionally noting that ASCSM should be placed more extensively in the public eye, to show that the student government group has a real impact on the Mines community.
Several questions were posed by the audience and other ASCSM members. Tim Weillert asked the candidates to, in ten seconds or less, state their most extreme goal for the upcoming year, were they to be elected as Student Body President. Truong and Thorpe both stated they would like to see more ASCSM participation, with Truong's goal being an attendance of 100 students at an ASCSM meeting. Pal responded that his goal was to improve students' quality of living.
Another major question was that of club relations. All agreed that clubs are an important part of Mines life, though Brian Pal again discussed his concerns as to how much funding clubs were getting versus their contribution back to

Truong stressed that this case was a good example of unforeseen circumstances that might be faced by the Student Body President in the next year

the Mines community. Jaime Thorpe mentioned her ongoing relationship with the Board of Student Organizations and her work on the proposed tier system to make it a win-win for all student organizations.
One of the final questions was posed in *absentia* by Zach Aman. The premise was that Mines had decided to scrap the Friday E-Days holiday, replacing it with a full complement of classes, quizzes, and tests. This hypothetical question addressed how the Student Body President would react to such a move.
Thorpe and Truong dismissed the scenario as highly unlikely, given that so many E-Days events take place on that day, but stated that they would go directly to the Mines administration to voice student concerns.
Truong stressed that this case was a good example of unforeseen circumstances that might be faced by the Student Body President in the next year, not too far removed from the recent Plus-Minus grading controversy.
Pal took a harder line, stating that he would organize a student strike to get the holiday back. "They can't fail everyone, right?" he pondered, though others in the room seemed uneasy as to the real answer to this question.
The forum concluded with closing remarks from the presidential candidates and Kevin Duffy's statement that, no matter who wins the elections, he felt student government would be led well.

Pal also announced his intentions of rechecking all campus clubs to see whether they were truly giving back to the Mines community in accord with the money given them in the Student Activities budget.

Music Review: *Hold Time*. M. Ward

Tim Weilert
Content Manager

Introduction:
Imagine you're asleep. You're dreaming. The world floats around you in bathed in bright colors and warm sounds. You hear a voice, it is drenched in reverb. Now wake up. This experience is not something of the surreal, but is an accurate description of M. Ward's newest work *Hold Time*.

Oftentimes a collaborator rather than a solo musician, Ward has worked with some of today's most prominent indie bands, including everyone from Bright Eyes and My Morning Jacket to Rilo Kiley's Jenny Lewis. Ward has added his mellow sound to more than a few projects of note within recent years. In 2008, Ward worked with singer/actress Zooey Deschanel on a critically acclaimed project known as *She & Him: Volume One*.

Memorable Song:
"Hold Time," the title track of the album, showcases Ward at his

best. Simple layers of strings and piano accompany ethereal vocals and provide a strong support for the deep lyrics. "You were beyond comprehension tonight, but I understood." "Jailbird" is another strong track with a straightforward pop-sensibility and catchy lyrics.

Forgettable Song:
"Oh, Lonesome Me," a Don Gibson cover featuring Lucinda Williams, is by far the black sheep of the record. The track starts out alright, but soon Williams's raspy vocals take over. Her delivery is so odd and out of place on the smooth track that it sounds like she's recovering from a bad head cold, not singing.

Final Thoughts:
This is a country record for those who do not like country music. Do not expect to hear Garth Brooks, or even Johnny Cash, but think Sam Cooke meets Elvis meets Bright Eyes. Ward's simple country/gospel/indie sound is mellow enough to relax listeners, yet catchy enough to garner repeated listening.

Beer Review: Hitachino Nest Red Ale

Akira Rattenbury
Staff Writer

Japanese beer is dry. This is as bad a stereotype as saying all Japanese people are terrible drivers and love karaoke. On the contrary, exceptions to these cardinal cultural rules exist. You just have to dig deeper to find them.

Enter Hitachino Nest Red Ale. The name is a testament to Japanese inventiveness. I have no idea why it is a "Nest Red Ale" or what that means. I do know that at 7% ABV in a bomber just a bit bigger than a pint, this beer can bring out the couch-nester in you after a long day at school.

I picked this one up in the special section at Golden Town Liquors for a staggering \$12. But like a sugar-hungry child staring into the eyes of cartoon characters on cereal boxes, I knew the goofy little owl on the bottle was a keeper.

The dark green bottle pours a slight amber-tinted ale with the usual yeast-laden translucence and yellow/orange hue indicative of the style. A thick, creamy white head stands prominently on top reminding me of an upside-down cooked egg.

My first sniff detects something odd immediately. A second deeper whiff brings out the truly distinctive smell of a freshly opened can of black olives. None of my fellow imbibers agree.

With Belgian Strong Pale Ales, one expects bountiful

spices and fruity odors to match the rich yeasty flavors. Behind the overpowering olive smell, this brew has just a mild tart and yeastiness reminiscent of the Saison Dupont featured a few weeks ago.

It has a heavier flavor than typical Japanese beer. Then again, it is not just another stereotypical cheap lager. It also has a milder essence and subdued pungency compared to other Belgian Strong Ales like Duvel. The mild taste matches the mild smell minus the olives.

First sip is well-carbonated and smooth. The ale leaves just a slight tingle and some sourness with a mildly astringent mouthfeel. I sense the potent yeasts, hops and typical flavors are paired down and seem almost gift wrapped for later enjoyment. It lacks a strong alcoholic taste and its mild flavor lingers with a feeling like a bland stickiness... just like rice.

Somehow the infusion of red rice gives this quirky beer a smoothness and also its amber hue. Instead of typical zests and fruits, it tastes of a more subtle floral sweetness.

Maybe the red

rice just kills the beer and simply takes up space typically reserved for more powerful flavors. I think it adds a balance and a smoother mouthfeel which hides the higher alcohol content.

Fellow samplers were full of compliments about the taste. "It reminds me of Asian flowers and gingerberries." Asked what Asian flowers or gingerberries tasted like, my fellow sampler shrugged, "I don't know. That's just what I imagine it is."

"Makes you want to hop right under a dragon. It's delicious," said sampler Alex Brown. "It has a lot of flavor for an Asian beer."



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Must See Movies

Mindbenders

Benjamin M. Weilert, Staff Writer

The film medium has long been able to represent ideas that are impossible to see in real life. Whether it's multiple personalities, the concept of time travel, or the high of illicit drug use, movies have been able to give an audience a look into a world that they would not otherwise be privy to. Through the use of special effects, or just plain artistic license, filmmakers can make the intangible tangible. If a movie can make an audience stop and think, even if it is just for a moment, about the oddities of the psychological world around us, then it could be considered a mindbender movie. This week's Must See Movies examine three such movies that push the envelope of human understanding.

1. Fight Club (1999)

What would you do if you found yourself in a dead-end job, unable to sleep and homeless due to a freak gas leak? Well, if you're the Narrator of Fight Club (Edward Norton), you'd make friends with Tyler Durden (Brad Pitt), a soap salesman who has a rich and colorful history as varied as the jobs he's had. When they move in together to an abandoned house, things start getting out of hand. In order to vent out all the pent up rage of being stuck in a mundane existence, the Narrator and Tyler start Fight Club, an underground battle arena. As the film progresses, the Fight Club becomes something much larger, and much more resembling a terrorist organization. Now, what if you were to find out that Tyler wasn't who you thought he was? In the mind-bending ending to Fight Club, the frightening reality of the mind's powers is fully brought to light.

2. Donnie Darko (2001)

Donnie Darko (portrayed by Jake Gyllenhaal) is your average 1980's teenager. Well, average except for a few abnormalities. First of all, he sees visions of a large, creepy rabbit. Secondly, he narrowly missed being killed by an errant jumbo jet engine crashing into his bedroom. Also, he knows when the world will end. Perhaps due to these abnormalities, Donnie commits some pretty impressive crimes that bring the quiet suburbia into an uproar. At first glance, Donnie Darko seems like an ordinary teenage angst film, but under the surface lies an intriguing science fiction. "Philosophy of Time Travel" is the name of the book given to Donnie that does a pretty good job of explaining the intricacies of the impossible. By the end of the film, the world hasn't ended, but time has traveled full circle to Donnie's demise.

3. Requiem for a Dream (2000)

The world of a junkie is an interesting place. Time no longer holds any relevance as everything seems to be traveling in slow motion or unbearably fast. Requiem for a Dream follows four addicts on their downward spiral to ruin. The intriguing thing about addictions is that sometimes they aren't to illegal substances. Even household activities like watching television are artistically represented in the same way as getting high on cocaine. However, even if it seems like everything is working out well and nothing could go wrong, consequences lie just around the dark corner. Requiem for a Dream begins to get intense as the consequences rear their ugly heads. From prostitution and prison to hospitalization, the results of a life of addiction are painfully obvious at the end of this film. If ever there's a film to get people to stop doing drugs, Requiem for a Dream is it.

For Homework – See Eternal Sunshine of the Spotless Mind (2004)

Tim's two cents

Commenter culture

Tim Weilert
Content Manager

An open and free exchange of ideas exists mere inches from our fingertips. Perhaps one of the most intriguing things about the internet is the direct parallels to philosophical reality. Within the last century we've seen the rise of post-modernism, and an underlying driving force: relativism. This article is not designed to argue semantics, but instead challenge the status quo. A phenomenon I'm calling "commenter culture" exists because relativism and technology have been working hand in glove.

Anyone who is familiar with YouTube will know what I'm talking about when I propose that 99% of comments on videos are inane chatter, often slipping toward pure vulgarity. YouTube stands as one example of the "commenter culture" that has developed alongside the internet. To have your opinions

published used to take some level of skill: an understanding of writing, the topic of discussion, and a reputable outlet.

Anyone can start a blog, upload a video, post on a message board, and critique art, science, religion, culture, etc. Intellect has died because the authority behind such expressions is oftentimes not present. You don't need to be educated in a particular field to publish an opinion, you just need a computer. The real tragedy is that almost all opinions (including those that have no authoritative backing) are considered valid and equal.

Fortunately there still exists a divide between most scientific study and "commenterism" (in the form of scientific, peer-reviewed, journals.) As an internet user, I have been guilty of taking advantage of the easy expression of opinion, however, as an engineering student, I still believe in authority and the need for education.

Cultural Diversities

Why women should not eat eggs

Georges M. Ngonyani
Staff Writer

Last week, I attended a class that teaches Mines Students about **Engineering and Sustainable Community Development (ESCD)**. The central concern of the discussion was understanding the community. Professor Jon Leydens invoked and guided the discussion and David Frossard is the Primary instructor of this class. Jon and David roleplayed a case that happened in Lesotho. While Jon role played as an ethnographer, David took the role of one of the richest pastoralists in Lesotho, a country in Southern part of Africa.

There was a problem Jon sought in Lesotho. Cattle were dying, but the pastoralists didn't want to sell them to get money. He didn't know that for the pastoralists in Lesotho, cattle were worth more than money. David, until the end of the roleplay, remained a lover of cattle rather than money. He would rather all of his cattle die than sell them. After the roleplay, students gave their ideas on what the Engineer should do when thinking of starting a project in a particular community. The class agreed that, understanding the community's valuables is vital and foremost.

I would like to connect this case to the story of **Women and Eggs**.

When I was young, every day after dinner, we would gather at our grandfather's compound to hear stories. Our grandfather meant to hand down our society's cultural values through oral tradition. Through stories, we would be able to remember, uphold, and honor our culture. One day, as he finished narrating the story he asked, "What does this story teach us?" We all responded in unison, "Expectant mothers shouldn't eat eggs." He said, "Very good. So when you marry, don't let your wives eat eggs when they are expecting."

The answer to us was so obvious because he told us that if an expecting woman eats eggs, then the baby will be born without hair on the head making the head look like an egg. Beause of this, women decided

not to eat eggs at all because hair is something valuable.

When I went to school, my nutrition teacher, who was a white British woman, taught that eggs are nutritious and she recommended that expecting mothers eat them. I was confused. I honored my grandfather but I didn't want to offend my teacher, too. I remained with that dilemma for more than fifteen years.

When I was 25-years old, I had a private conversation with my grandfather, Mayokola. I wanted to understand more about why women shouldn't eat eggs. To my surprise, he said that there was nothing wrong for women to eat eggs, but the health circumstances forced the elders to make eggs a taboo for women. They understood that eggs were nutritious and that if a pregnant woman eats them, the baby in the womb would be healthy and grow big. Before the inception of this taboo, many babies and mothers died due to delivery complications. There were no hospitals or experts who knew how to increase the way through which the baby had to come out. So if the baby was bigger than the way, death was the expected.

As a preventive measure to this problem, they thought that it would be rational if the expecting mothers ate less protein so as to limit the growth of the baby in the womb. Eggs were more easily available than other sources of protein. Since hair was valued, they created a taboo for women not to eat eggs to prevent deaths.

Before my grandfather explained to me this reason, I thought that men were greedy. They wanted the best things for themselves and maltreating women; of course this was the argument of my nutrition teacher. She didn't want to find out why eggs were a taboo for women. She prejudged the practice. My call to Engineers who plan to engage in community development is that your project will only be sustainable if you take initiatives to understand the community you work with. "Learn *their* language before teaching them *your* language."



Minds at Mines

Celebrating springtime

Roby Brost
Staff Writer

This past week brought the first day of spring. Normally typified by snowstorms with multiple feet of snow and chilly weather, spring in Colorado nonetheless brings up happy memories. This year, there wasn't a blizzard over Spring Break, just beautiful weather. With the outdoors sunny and warm, many students at Colorado School of Mines are seizing the opportunity to be outside while the sunshine lasts. These warm days rekindle happy springtime memories from the past, and fellow students at Mines recount the best parts about spring both past and present.



"Spring is time to go ski A Basin with a keg in my trunk. My favorite memory of spring is probably playing tennis in high school."
Dan Williamson and Erik Johnson

"My favorite part about springtime is that it's the time when all the flowers start popping up. It's so colorful. It brings back childhood memories of breaking the icicles off of the roof and sucking on them like Popsicles."
Mary Snooks



"My best childhood memory in the spring was field day at elementary school. Everyone knows it was the coolest. The best part of spring now still has to do with school. It's the time right before we get out for the summer."
Eric Threet

"Spring brings spring football. It's the perfect time; not too hot, not too cold. My best memory is of my first bike ride. I remember it being in the spring."
Ryan Marcellus



"The best part about spring is the warm weather. It's the best time to just take a nap on the grass. When I was little, the best part was being able to plant a garden with my Mom."
Sarah Cooper



"When I was younger springtime meant teasing the cows on my dirt bike. The best part about spring is when it's warm. Being able to go biking, be outside and of course, slack lines. Fun stuff like that."
Timothy O'Rourke





Hoodies cause emo

Scientists confirm correlation

Benjamin M. Weilert
Right to Bare Arms

Research being conducted at the Center for Rationalizing Youth Subculture (CRYS) has finally achieved a breakthrough in the explanation for the subculture in today's youth known as "emo." This demographic usually consists of high school students who are sad all the time, cannot see behind their bangs, and listen to Dashboard Confessional. A large amount of governmental funds have been allocated for research to the cause of the emo. Scientists at CRYS have finally broken the code and seem to know what causes a person to become emo: hoodies.

Lead researcher at CRYS, Dr. Drew Meyer, gave this statement at a conference, "It's quite simple, really. The hoodie has just enough extra weight that is only distributed around the head and neck. This extra weight causes distortions in the spine that produces large amounts of pain in the wearer." Through psychological analysis of test subjects, this pain leads to depression, thoughts of suicide, and tolerance for My Chemical Romance.

CRYS's statistical analyst, Dr. Kurtis Griess, says that the data collected leaves almost an undeniable correlation between wearing a hoodie and being emo. "Compared to our control set, who wore just normal sweat-shirts, the people who wore hoodies tended to exhibit emo behavior even after just one instance of wearing a hoodie. In fact, once the hoodie was removed from the test subjects, they continued to show evidence of being emo."

The hoodie correlation was obvious in the subjects who were no longer wearing the clothing item, as they tried to replicate the effect of wearing a hoodie. Hairstyles of these subjects tended to be mid-length, with bangs that would cover the eyes, replicating the shadows and darkness produced when a hoodie is worn on the head. Long sleeve shirts worn underneath T-shirts were another sign of a post-hoodie subject. "Perhaps the long sleeves of the hoodie are used to hide the scars on their arms from extended razor-blade use," explained Dr. Meyer, "However, since we have been unable to see the bare arms of these subjects, this theorem is purely hypothetical."

Another disturbing statistic of the emo is its tolerance to the genre of music referred to as "screamo." Dr. Griess explains, "Since most of the hoodie wearers wear their hood up, there is a natural barrier to acoustical stimulants. In order to overcome this barrier, the music they listen to must be louder and more angst filled than the normal "emo" music provides." Music also seems to be the primary nourishment for the emo. However, due to its low nutritional value, music does not constitute a healthy daily diet, thereby causing the emo to be much skinnier than the rest of the obese, general public.

Despite finding the link between the hoodie and the creation of the emo, as of present time, no cure has been found. Common prescriptions for emo are sunlight, interaction with other people, outdoor activities, and large doses of speed and/or disco music. If you or someone you know may be emo, please consult your family physician and/or Hot Topic for a correct diagnosis.

Mathematical Geology Spring conference: Flatland field trip 191

Janeen Neri
Mathematical Punologist

The math majors of Mines have just returned from their annual Flatland Field Trip, an intercollegiate event for "students so nerdy, they have blown-up pictures of Riemann, Euler, and Cauchy on their walls" said event coordinator Dr. Jordan Campbell. Though FFT has been held since 1965, this is the first time that *The Oredigger* has been allowed to cover it. "We realized we were being too insular," admitted Campbell, "and less people were majoring in mathematics because they didn't get to see this – we used to restrict FFT to juniors and above majoring in theoretical mathematics only, but we've definitely been loosening the requirements. Twenty years ago, you had no hope of coming if you were a Mines student; now at least we let the Computationals come... still a bit leery about the Stats."

The two-day conference began last Friday, when most universities are wrapping up their spring breaks. The students were bused in to Portland International Airport, where they were greeted by 11 chartered KM-p13x planes. There were several noticeable *oohs* and *aaahs* at this point. Once everyone had gotten onto the planes, each group got a short history of FFT. "Our name comes from a famous book by Edwin Abbott," explained Dr. Hermann Christoffel, one of the tour guides, "I wonder how many of you have read it?" At this point, several hands shot up. Christoffel went on to explain that *Flatland: A Romance of Many Dimensions*, written in 1884 as a social satire, is now known for the way that it makes the reader able to grasp the experience of one, two, and even four-dimensional space. "We will not be traveling to Flatland, I'm afraid," Christoffel remarked, "but we hope that our field trip will be just as eye-opening."

Seven hours later, the planes touched down on a small island in the Pleiss Sea. When asked where, precisely, we were, Christoffel responded mysteriously "it won't be on your map, but it *has* been mapped." Most of the students nodded in understanding as they unbuckled their seatbelts and retrieved their luggage.

The landscape outside was fairly ordinary, something which confused some of the students. "Wait, how is it possible that there are hills, but you don't have issues with infinite cliffs?" asked Mines sophomore Mary Rudin. "Well," Christoffel replied, "does anyone have any ideas?" One student called out "Because it's undefined past the coast?" Christoffel shook his head. "No, negative values are *not* undefined. They're just wet. Anyone else?" After pausing for a beat, he added, "Come, I'll show you how it can be bounded." At this, he began leading the group toward a fenced-off pasture area.

The owner of the area, Jim Doyne, proceeded to show the students his orchard of syngulera trees, stunted little plants laden with edible fruit. "One o' these things," Doyne said, "and you're looking at a typical yield fit to fill two pies, aye. Got to make certain you get them in when you're setting the contour of your fence, otherwise your land's worth nothing." The mathematics students were taking rapid notes by this point.

After they were finished exploring the orchard, Christoffel led the group to a flat plain, where they formed a ring and did some group algebra problems before heading to bed.

The next morning, the students were given a tour of the Center for Mathematical Biology. The building was filled with stacks and stacks of square and rectangular Petri dishes. In each dish were neat rows and columns of tiny organisms, "which display interesting interactions, even transformations, when brought near other colonies," Christoffel explained. After several demonstrations with different sizes and shapes of colonies, the students were allowed a few hours to experiment before it was time to head back to the planes.

As the students got off the KM-p13x planes and back into their buses, Campbell reminded them to "be sure to come back next year! If our shuttle construction stays on schedule, we'll be visiting Euclidean planets in FFT 193!"



"Flatland. The Center for Mathematical Biology and a syngulera tree."

PETA Problems

Adam Freeland
Dog Lover

PETA (People for the Ethical Treatment of Animals) has canceled all planned recruitment dinners at The Colorado School of Mines. They issued a written statement on recycled cotton paper to the AP (Associated Press) regarding their planned handling of what has been called the 'Mines hates animals' incident. Unfortunately, no one in the AP cared. Fortunately, an unpaid intern, with a degree from Boulder in Humanities, faxed the Oredigger a copy (You can thank him from 4-11 PM, MTWR @ checkout stand #5 in King Soopers in Golden):

It has come to the attention of PETA that the Colorado School of Mines has been and continues to actively support the abuse of Mules in third-world mining operations. The mules are not properly trained on mine evacuation procedure. They are not even given proper respiration protection, as stipulated by the MSHAM (Mining Safety and Health Administration for Mules) regulation #4. And, worst of all, the mules are used to place explosives that their human counterparts refuse to.

Until it can be discerned that CSM no longer teaches or endorses these practices, PETA has officially canceled all planned recruitment efforts at CSM. We encourage all other companies who take the time to think about our evolutionarily-challenged friend to do the same. Together, we can make a difference.

With a downward turning economy, the Environmental Engineering department stands to lose out on 3 internships for their graduating seniors. PETA had planned to hire 3 interns to design an environmentally conscious way to control malaria in Africa without harming any mosquitoes. Their former efforts were thought to be a failure, until now.

PETA has sequestered all information about a chemical developed by Chemical Engineers that had the capability to eradicate mosquitoes in any given area with no human side effects. The substance was so safe that many scientists consumed spoonfuls of it in demonstrations. We only know of this chemical from an internal PETA memo in which a board member, presumably an ape, stated, "It would be wrong to say that the prospect of saving 2,000,000 people a year is worth killing billions of mosquitoes and a few birds. We can proudly look at those people and say, 'You are the bravest of us all.'"

Mines has allocated \$470,000 in anticipated economic stimulus grant money to investigate the mule abuse issue. It is widely believed that this entire 'Mines hates animals' incident stemmed from a single PETA official who, while looking at an image of Blaster, saw the stick of dynamite. As he stood up in shock, he popped his back triggering an LSD flashback. During this flashback, he imagined that the mining practices of the past centuries were still in place.



ADAM FREELAND / OREDIGGER

"Blaster. A last meal before venturing into the mine."

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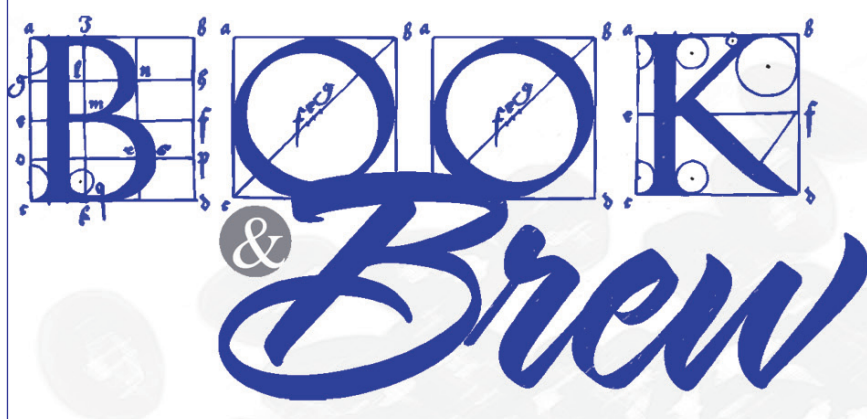
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